

CLAIMS

1. A heat thickening composition for coating slips comprising at least one heat-sensitive copolymer, characterized in that said copolymer has a comb structure and is composed of a polymer segment, known as the backbone segment, to which are grafted at least two identical or different polymer side segments with either the backbone segment or the side segments having a lower critical solubility temperature LCST of between 30 and 80°C.

2. A heat thickening composition as claimed in claim 1, characterized in that the polymer backbone has the lower critical solubility temperature LCST of between 30 and 80°C.

3. A heat thickening composition as claimed in claim 1, characterized in that the polymer side segments have the lower critical solubility temperature LCST of between 30 and 80°C.

4. A heat thickening composition as claimed in one of claims 1 to 3, characterized in that it comprises several copolymers arranged together so as to form a crosslinked structure in which their polymer segments having the lower critical solubility temperature LCST are the crosslinking nodes and at least a portion of their segments not having a lower

critical solubility temperature between 30 and 80°C  
establish connections between said nodes.

5. A heat thickening composition as claimed  
in one of claims 1, 2, 3 or 4, characterized in that  
5 the segments not having the lower critical solubility  
temperature of between 30°C and 80°C are water-soluble  
in at least this temperature range.

6. A heat thickening composition as claimed  
in one of the preceding claims, characterized in that  
10 the polymer segments not having a lower critical  
solubility temperature are water-soluble in the  
operating temperature range of said heat thickening  
composition.

7. A heat thickening composition as claimed  
15 in one of the preceding claims, characterized in that  
the polymer segment not having a critical temperature  
is a water-soluble polymer of ethylenic type.

8. A heat thickening composition as claimed  
in claim 7, characterized in that said polymer derives  
20 from the (co)polymerization of water-soluble ethylenic  
monomers of vinyl, acrylic, styrene or diene type  
and/or of vinyl ester type.

9. A heat thickening composition as claimed  
in claim 7 or 8, characterized in that the monomers are  
25 chosen from (meth)acrylic acid, diacids, such as  
fumaric acid or itaconic acid, or their salts, maleic  
anhydride, acrylamide and its derivatives, such as

acrylamidomethylpropanesulfonic acid, or their salts, styrenesulfonic acid, vinylbenzoic acid or their salts, or vinylsulfonic acid, methallylsulfonic acid or their salts.

5                   10. A heat thickening composition as claimed in claim 9, characterized in that the monomers are acrylic or methacrylic acid, acrylamides and their derivatives, fumaric and maleic acids and sulfonated monomers, such as 2-acrylamidomethylpropanesulfonic  
10 acid (AMPS) and its alkaline salts and vinylsulfonate.

                  11. A heat thickening composition as claimed in one of claims 7 to 10, characterized in that the polymer segments have a molecular weight at least of greater than 1 000 and preferably at least of greater  
15 than 20 000.

                  12. A heat thickening composition as claimed in one of claims 7 to 11, characterized in that the polymer segments result from the polymerization of acrylic acid (AA) and/or 2-acrylamidomethylpropane-  
20 sulfonic acid (AMP).

                  13. A heat thickening composition as claimed in one of the preceding claims, characterized in that the polymer segments having a lower critical solubility temperature LCST of between 30 and 80°C derive from  
25 polyoxyalkylene polymers.

                  14. A heat thickening composition as claimed in claim 13, characterized in that the oxyalkylene unit

or the various oxyalkylene units present in the polyoxyalkylene have at most 6 carbon atoms.

15. A heat thickening composition as claimed in claim 13 or 14, characterized in that the polymer  
5 segments having a lower critical solubility temperature are composed of oxyethylene (OE) and/or oxypropylene (OP) units.

16. A heat thickening composition as claimed in one of claims 13 to 15, characterized in that the  
10 segments having a lower critical solubility temperature are composed of at least 5 oxyalkylene units.

17. A heat thickening composition as claimed in one of the preceding claims, characterized in that the copolymer comprises 0.1 molar % to 50 molar % of  
15 polymer segments having a lower critical solubility temperature (LCST) of between 30 and 80°C.

18. A heat thickening composition as claimed in one of the preceding claims, characterized in that the copolymer comprises 0.1 molar % to 5 molar % of  
20 polymer segments having a lower critical solubility temperature (LCST) of between 30 and 80°C.

19. A heat thickening composition as claimed in one of the preceding claims, characterized in that the copolymer is chosen from:

25 - one copolymer prepared from POE-POP-POE triblock macromonomer and from acrylic acid (respective molar percentages: 2.3% and 97.7%),

- one copolymer prepared from POE-POP-POE triblock macromonomer and from acrylic acid (respective molar %: 1.6% and 98.4%),

- one copolymer prepared from POE-POP-POE triblock macromonomer and from acrylic acid (respective molar %: 3% and 97%), and

- one copolymer prepared from POE-POP-POE triblock macromonomer and from acrylic acid (respective molar %: 2% and 98%), preferably by copolymerization.

10           20. A coating slip for the coating of paper and/or board comprising at least one heat thickening composition as claimed in one of claims 1 to 18.

            21. The use of a heat thickening composition as claimed in one of claims 1 to 19 or of a coating slip as claimed in claim 20 in obtaining better coat coverage in the coating of paper and board.

            22. The use of a heat thickening composition as claimed in one of claims 1 to 19 or of a coating slip according to claim 20 in improving the coat coverage in the coating of paper and board with a low weight of coat.

            23. The use of a heat thickening composition as claimed in one of claims 1 to 19 or of a coating slip as claimed in claim 20 for improving the smoothness, the opaqueness and/or the gloss of coated paper and board with a low weight of coat.